Transit Station Improvements

Improving Public Transit Waiting Conditions

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TDM Encyclopedia
Victoria Transport Policy Institute

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This chapter describes ways to improve public transit stops and stations in order to make them more attractive and improve waiting conditions.

Description

Improving Transit Station and Stops (also called *transportation terminals*) can increase the convenience, comfort and attractiveness of Public Transit travel, increasing transit ridership and supporting Transit Oriented Development. For a typical transit trip, 10-30% of travel time is spent waiting, and passengers tend to be particularly sensitive to the conditions where they wait. Currently, most North American transit systems have poor quality Stations and Stops, creating a major deterrent to transit travel. There are many specific ways to improve transit waiting conditions:

- Create Stations and Stops that are comfortable, clean, attractive and safe, with services such as seats, public telephones, washrooms and vendors.

- Provide shade and air conditioning during hot conditions and heating during cold conditions.

- Provide convenient user information, including transit route, schedule and fare information. Provide real-time vehicle arrival information on signs and website, so passengers know exactly when their train or bus will arrive (this significantly reduces stress and allows passengers to use their waiting time more efficiently). Provide local wayfinding to help passengers travel through stations (particularly large and busy terminals) and to local destinations.

- Provide bus shelters separated sufficiently from roadways to minimize passenger exposure to traffic risk, noise, dust and splashes.

- Provide excellent pedestrian access, including convenient and safe crossing of busy roads, and pedestrian shortcuts where appropriate. Insure that stations and stops reflect Universal Design.

- Implement Complete Streets Policies which recognize that roadways often serve diverse functions including through travel, recreational walking, socializing, vending, and nearby living, which must be considered and balanced in roadway design and management.

- Address Security Concerns by providing visibility and emergency response, and by locating other services and activities within or adjacent to stations, such as vendors and stores, government and commercial offices and police stations.

- Integrate stops and stations with nearby destinations, using Transit Oriented Development principles.

Table 1 lists various factors that can be considered with evaluating Transit Station and Stop Level-Of-Service. These factors can be prioritized from high to low importance, and graded from A (best) to F (worst). This can be used identify problems, establish minimal service levels, evaluate a particular Station or Stop, and to track trends.

Table 1 **Transit Station and Stop Level-Of-Service Factors**

Feature	Description	Indicators
Weather protection	User protected from sun and rain.	• Bus shelters and covered platforms. • Shade trees and awnings. • Enclosed waiting rooms.
Sense of Security	Perceived threats of accidents, assault, theft or abuse.	• Perceived transit passenger security. • Accidents and injuries. • Reported security incidents. • Visibility and lighting. • Official response to perceived risks.
Comfort	Passenger comfort.	• Seating availability and quality. • Space (lack of crowding). • Quiet (lack of excessive noise). • Fresh air (lack of unpleasant smells) • Temperature (neither too hot or cold) • Cleanliness of stations and nearby areas. • Washrooms and refreshments.
Efficiency	Ease and speed of station activities.	• Ticket purchasing. • Baggage checking and collecting. • Security inspections.
Accessibility	Ease of reaching transit stations and stops.	• Distance from transit stations and stops to destinations. • Walkability (quality of walking conditions) in areas serviced by transit. • Automobile Park-&-Ride availability. • Bicycle Parking availability. • Taxi service availability.
Transit-Oriented Development	Quality of development in areas near transit stations and stops.	• Quality and density of development within 500 meters of transit stations. • Walkability (quality of walking conditions) in areas serviced by transit. • Affordability of housing within 500 meters of transit stations.
Universal design	Accommodation of diverse users including people with special needs.	• Accessible design for stations and nearby areas. • Ability to carry baggage • Ability to accommodate people who cannot read or understand the local language.
User information	Ease of obtaining information on transit routes, schedules, fares, connections, and destinations.	• Availability, accuracy and understandability of information at stops, stations, destinations, Internet, telephone, and transit staff. • Real-time transit vehicle arrival information. • Availability and quality of wayfinding

		signs, maps and other information for navigating within the station and to nearby destinations. • Quality of announcements. • Availability of information for people with special needs (audio or visual disabilities, inability to read or understand the local language, etc.). • Availability of pay telephones.
Courtesy and responsiveness	Courtesy with which passengers are treated.	• How passengers are treated by transit staff. • Ease of filing a complaint. • Speed and responsiveness with which complaints are treated.
Aesthetics	Attractiveness of transit stations and stops.	• Attractiveness of stations and stops. • Attractiveness of station areas.

This table lists various factors to consider when evaluating public transit Stations and Stops.

It is generally infeasible to provide all services at every transit station and stop, but it is possible to insure that all transit stations and stops meet certain minimal levels of service (for example, that all are considered safe and accessible to users, and have basic rider information), that major stations (those where multiple routes connect or that accommodate large numbers of passengers) have full services and are well integrated into the community, and that transit station and stop improvements are considered as part of overall efforts to improve transit service and increase transit ridership.

How it is Implemented

Transit Station and Stop improvements are generally implemented by public transit agencies, often in conjunction with local governments, transportation agencies, developers and individual businesses. Stations and Stops can be integrated into the construction or redevelopment of buildings such as shopping malls and offices. In some situations, building space within Transit Stations and Stops can be leased on favorable terms to businesses such as coffee shops to provide waiting areas. Some improvements (such as real-time vehicle arrival information) are implemented by transit agencies as part of overall system enhancements. Others (such as vendors that sell refreshments and periodicals, and WiFi services) are implemented by businesses for profit, or by community groups as public amenities. Some amenities, such as bus shelters and benches, are sometimes financed through advertising.

Travel Impacts

Research indicates that travelers are particularly sensitive to waiting time, so improving public transit waiting conditions tend to increase transit ridership, particularly discretionary travelers who would otherwise drive (Kittleson & Associates 2013; Pratt 2004; Litman 2007). Improving station conditions tends to expand a rail station's catchment area and increase transit ridership (Cascetta and Cartenì 2014). Public transit waiting condition improvements tend so support Transit Oriented Development. People who live or work in such areas tend to drive significantly less and rely significantly more on alternative modes, including walking and public transportation. See Transit Evaluation, for more information on travel impacts.

Table 2 **Travel Impact Summary**

Travel Impact	Rating	Explanation
Reduces total traffic.	3	Can reduce automobile use.
Reduces peak period traffic.	3	Tends to be attractive for commute trips.
Shifts peak to off-peak periods.	1	Off-peak fare discounts induce some shifts.
Shifts automobile travel to alternative modes.	3	
Improves access, reduces the need for travel.	2	Can encourage higher-density, clustered land use.
Increased ridesharing.	0	
Increased public transit.	3	
Increased cycling.	1	Can support cycling.
Increased walking.	2	Supports pedestrian travel.
Increased Telework.	0	
Reduced freight traffic.	0	

Rating from 3 (very beneficial) to –3 (very harmful). A 0 indicates no impact or mixed impacts.

Benefits And Costs

Improving Transit Stations and Stops can significantly improve the quality of transit travel, providing direct benefits to users and attracting new transit riders, providing benefits including reduced traffic congestion, road and parking costs, accidents, energy consumption and pollution emissions. It helps reposition transit as a higher quality service.

Where Station Improvements are a catalyst for Transit Oriented Development it can provide indirect benefits, including Increased Property Values and improved community Livability near transit stations, and increased Economic Development. These benefits can be substantial, in some cases offsetting a significant portion of transit service public costs (Smith and Gihring, 2003).

Costs include the capital and operating expenses, and any disruptions that Stations and Stops impose on adjacent land uses.

Table 3 **Benefit Summary**

Objective	Rating	Comments
Congestion Reduction	3	Reduces automobile use on congested corridors.
Road & Parking Savings	2	Reduces road space and parking requirements. Buses may increase road wear costs.
Consumer Savings	3	Provides affordable mobility.
Transport Choice	3	Increases transport choice for non-drivers.
Road Safety	2	Tends to be safer than driving overall.
Environmental Protection	2	Tends to reduce air pollution.
Efficient Land Use	3	Tends to discourage sprawl.
Community Livability	3	Contributes to neighborhood livability.

Rating from 3 (very beneficial) to –3 (very harmful). A 0 indicates no impact or mixed impacts.

Equity Impacts

Transit Station improvements can significantly improve travel conditions for economically and physically

disadvantaged groups.

Table 4 **Equity Summary**

Criteria	Rating	Comments
Treats everybody equally.	1	Provides benefits that are valued by most groups.
Individuals bear the costs they impose.	-1	Requires subsidies, but often less than for driving.
Progressive with respect to income.	3	Provides affordable mobility for lower-income people.
Benefits transportation disadvantaged.	3	Provides mobility for non-drivers.
Improves basic mobility.	3	Provides basic mobility.

Rating from 3 (very beneficial) to –3 (very harmful). A 0 indicates no impact or mixed impacts.

Applications

Transit Stations and Stops improvements can be implemented in virtually any geographic condition, including large cities, towns and rural villages. It is generally implemented by state, regional and local governments, often in conjunction with private businesses.

Table 5 **Application Summary**

Geographic	Rating	Organization	Rating
Large urban region.	3	Federal government.	2
High-density, urban.	3	State/provincial government.	3
Medium-density, urban/suburban.	2	Regional government.	3
Town.	2	Municipal/local government.	3
Low-density, rural.	2	Business Associations/TMA.	2
Commercial center.	3	Individual business.	2
Residential neighborhood.	2	Developer.	2
Resort/recreation area.	3	Neighborhood association.	2
		Campus	3

Ratings range from 0 (not appropriate) to 3 (very appropriate).

Category

Improved Transport Options.

Relationships With Other TDM Strategies

Transit service improvements support and are supported by most other TDM strategies, particularly Transit Oriented Development, Smart Growth, New Urbanism, Complete Streets, Bus Rapid Transit, and Nonmotorized Transportation Planning. Transit service improvements are usually more cost effective when matched with Transit Encouragement programs and incentives for motorists to reduce their driving, such as Commute Trip Reduction programs.

Stakeholders

Transit Station and Stop improvements are generally implemented by government agencies, including transit agencies, and local planning agencies, often with state or regional funding. They sometimes require public support for additional funding. Some require business support.

Barriers To Implementation

Major barriers include inadequate funding and a lack of support, since in most communities only a minority of residents regularly use public transit.

Best Practices

The Reconnecting America Best Practices Clearinghouse (www.reconnectingamerica.org/public/practices) provides recommendations for transit station and stop improvements. Transit Stations and Stops should:

- Be built to high design standards.
- Be integrated into communities in terms of Accessibility and aesthetics.
- Incorporate services, including retail shops.
- Maximize comfort and Security.

Wit and Humor

Cowardice asks the question: 'Is it safe?'
Expediency asks the question: 'Is it politic?'
Vanity asks the question: 'Is it popular?'
But conscience asks the question: 'Is it right?' And there comes a time when one must take a position that is neither safe, nor politic, nor popular but one must take it because one's conscience tells one what is right.
-Dr. Martin Luther King

Case Studies and Examples

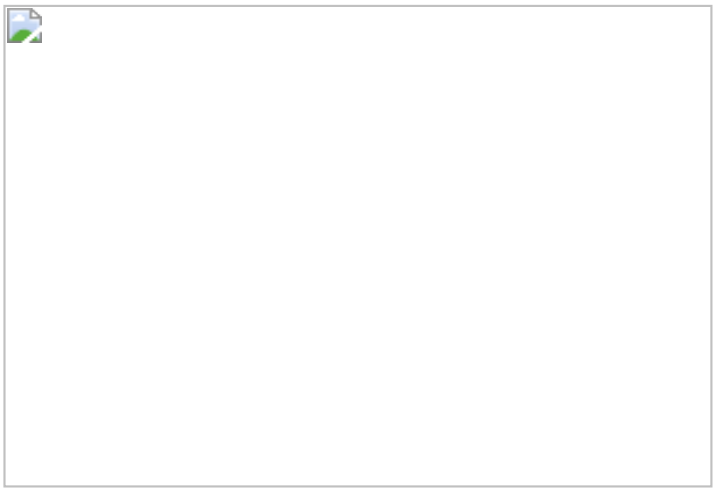
For case studies and examples of many different types of successful transit improvements see the Center for Transportation Excellence (www.cfte.org); "Light Rail Transit Success Stories" (www.lightrailnow.org), Pratt (1999), CIT (2001), TRB (2001) and TranSystem (2005).

Tool for Transit-Oriented Development Planning (www.reconnectingamerica.org/public/stories/2501)

The *Performance-Based Transit-Oriented Development Typology Guidebook* created by the Center for Transit-Oriented Development is a user-friendly tool for evaluating conditions around transit stations and determining how they influence factors such as per capita vehicle ownership and travel, consumer transportation costs, public transit ridership, energy consumption and pollution emissions. It uses real performance outcomes measured at more than 3,700 existing transit station areas in 39 regions around the United States. This information gives stakeholders the ability to evaluate the performance of the transit zones in their neighborhoods.

Staples Street Bus Station (www.pps.org/info/projects/transportation_projects/staples_street)

The Corpus Christi Staples Street Bus Station offers passenger services, comfort, and a sense of safety and community, integrated with retail development. It resembles a Spanish-style civic building, with 1,500 hand-painted ceramic tiles produced through a public art project decorating the entry arch, column bases, benches, planters, light fixtures and phone booths. By making people-friendly improvements, this type of transit center is able to attract more passengers and economic activity to the area. Ridership increased notably with the consolidation of area bus stops at this one station. The station serves 14 bus routes and approximately 5,000 daily transit users.



The Corpus Christi Staples Street Bus Station offers passenger services, comfort, and a sense of safety and community.

Transit Access Research (TCRP 2009)

Research by the Transit Cooperative Research Program Based made the following conclusions concerning access to transit stations and stops:

- Access planning must effectively consider local characteristics (e.g. demographics, land use) in order to develop a balanced and successful multi-modal access plan.
- The body of literature on access mode choice shows that while characteristics of individual travelers play a large role in access decisions, external factors that can be affected through policies and design also play a large role.
- There are several well-established evaluation tools available to assess the quality of pedestrian, bicycle, and transit facilities.
- Transit-Oriented Development has a number of environmental benefits and the potential to increase ridership; however, to be successful TOD must incorporate partnerships and be sensitive to local market conditions.
- Park-and-ride facilities provide a large portion of ridership for many high-capacity transit systems, and will likely continue to play a large role for the foreseeable future to maximize transit ridership and availability.
- Where parking demand exceeds capacity, research shows that parking pricing and TDM measures can encourage auto drivers to switch to other access modes, but can run the risk of reducing ridership if not priced appropriately.
- Transit feeder services that are both time-competitive and cost-effective are difficult to provide, but have potentially major benefits. Potential strategies to accomplish these dual objectives include flexible routes, ITS, and fare coordination.
- Pedestrian access to transit stations is determined by many factors, including distance, urban design, pedestrian facilities, crime, and characteristics of individual travelers.

- While transit agencies cannot affect distance, agencies do have the potential to increase walking mode shares through other improvements.

- Surveys of walk access trips show that many pedestrian walk between 0.5 and 1 miles to access transit, indicating that the traditional focus on only the first half mile by underestimate the actual potential for walking trips.

- Bicycle access is largely dependent on factors outside of transit agency control (e.g. quality of the bicycle network); however, provision of bicycle parking at transit stations significantly increases bicycle access.

Rutherford Station Square (www.pps.org/info/projects/transportation_projects/rutherford_station_sq)
The Rutherford, New Jersey Train Station is an anchor for the town's main street. It serves as a transportation hub, with integrated bus, train and taxi service. The station's redesign has stimulated local downtown development.

Sacramento Rail Station Improvements (www.sacrt.com/stationimprove.stm)
In order to improve traveler convenience and comfort that Sacramento Regional Transit, in partnership with the Capitol Area Development Authority (CADA) and the City of Sacramento, is improving light rail stations as part of a local redevelopment program. Both stations will also receive sidewalk improvements and directional signage within a 1-block radius, as well as other improvements to be constructed by the City. Below are specific improvements.

13th Street Station
- Mini-high shelters on ramps
- Cosmetic improvements to existing shelter
- Additional light poles
- New seating
- Miscellaneous plant replacements
- Miscellaneous tree and shrub pruning
- Repainting

16th Street Station
- New mini-high ramp and removal of existing vertical lift
- Mini-high shelters on ramps
- Replace existing shelter canopy
- Additional light poles
- New seating
- Removal of seat walls on south side
- Increase sitting/standing pavement area on south side
- Re-landscaping
- Repainting

References And Resources For More Information

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CalTrans (2002), *Statewide Transit-Oriented Development Study: Factors For Success in California*, California Department of Transportation (www.dot.ca.gov/hq/MassTrans/tod.htm).

Ennio **Cascetta** and Armando Cartenì (2014), "The Hedonic Value Of Railways Terminals. A Quantitative Analysis Of The Impact Of Stations Quality On Travellers Behaviour," *Transportation Research Part A: Policy and Practice*, Volume 61, March, pp 41-52; summary at www.sciencedirect.com/science/article/pii/S0965856413002462.

Center for Transportation Excellence (www.cfte.org) provide research materials, strategies and other forms of support on the benefits of public transportation.

Robert **Cervero**, et al. (2004), *Transit-Oriented Development in the United States: Experience, Challenges, and Prospects*, Transit Cooperative Research Program, Transportation Research Board (http://gulliver.trb.org/publications/tcrp/tcrp_rpt_102.pdf).

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Nelson/Nygaard (2006), *Toolkit for the Assessment of Bus Stop Accessibility and Safety*, ESPA, Easter Seals Project Action Clearinghouse (www.projectaction.org).

NextBus (www.nextbus.com) is a private company that uses Global Positioning Systems (GPS) to provide real-time transit vehicle arrival information to passengers and managers in various North American cities.

Gloria **Ohland** and Shelley Poticha (2006), *Street Smart: Streetcars and Cities in the Twentry-First Century*, Reconnecting America (www.reconnectingamerica.org/html/TOD/StreetcarBook.htm).

Richard H. **Pratt** (2004), *Traveler Response to Transportation System Changes*, TCRP Report B12-A, TRB (www.trb.org); at http://www.trb.org/TRBNet/ProjectDisplay.asp?ProjectID=1034.

Project For Public Places (www.pps.org) is a nonprofit organization dedicated to helping people create and sustain public places that build communities, with particular emphasis on Transit Oriented Development. It offers "Stations as Places" workshops which explore the basic principles of successful public spaces and successful transit stations.

PPS and Multisystems (1999), *The Role of Transit Amenities and Vehicle Characteristics in Building Transit Ridership*, Transit Cooperative Research Program Report 46, National Academy Press (www.trb.org).

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